GP1S50/GP1S51V GP1S52V/GP1S54

General Purpose Photointerrupter

■ Features

1. High sensing accuracy (Slilt width : 0.5mm)
2. Both-sides mounting type : **GP1S50** (Case height : 10mm)
   Either-side mounting type : **GP1S51V** (Case height : 10mm)
   PWB direct mounting type : **GP1S52V** (Case height : 10mm)
   PWB direct mounting type : **GP1S54** (Case height : 8mm)

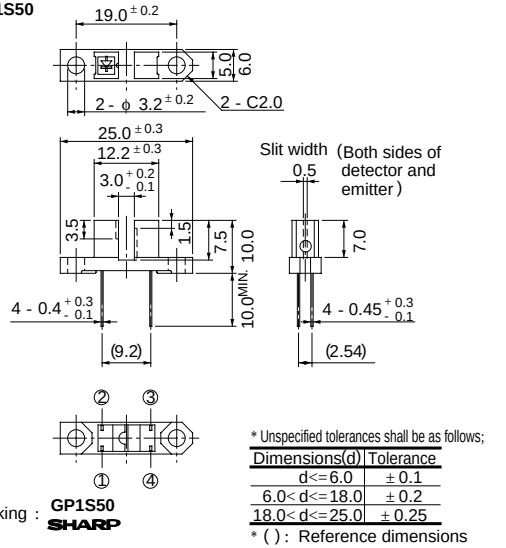
■ Applications

1. OA equipment, such as FDDs, printers, facsimiles
2. VCRs

■ Outline Dimensions

(Unit : mm)

GP1S50

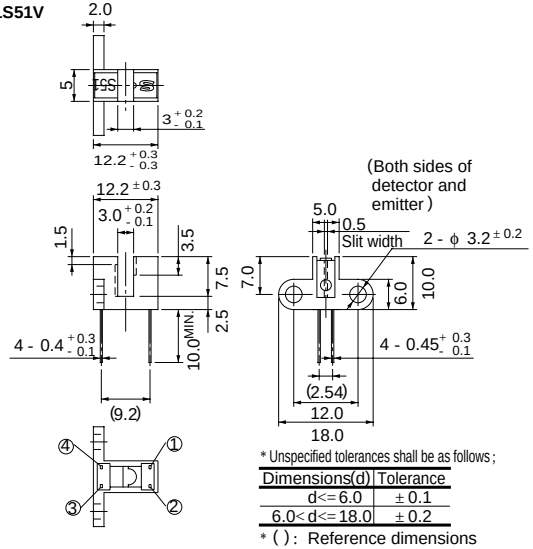


Marking : GP1S50 SHARP

Dimensions(d)	Tolerance
d<=6.0	± 0.1
6.0< d<=18.0	± 0.2
18.0< d<=25.0	± 0.25

* Unspecified tolerances shall be as follows;
* ( ) : Reference dimensions

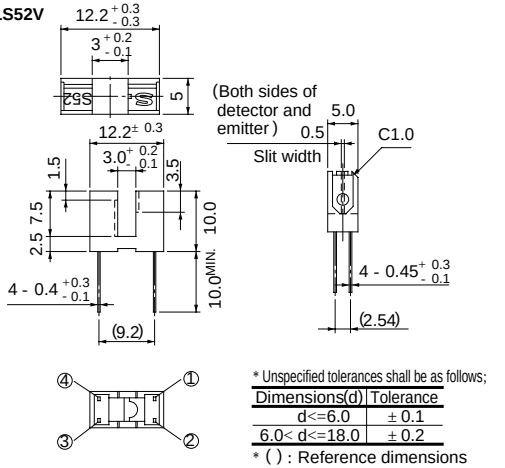
GP1S51V



Dimensions(d)	Tolerance
d<= 6.0	± 0.1
6.0< d<= 18.0	± 0.2

* Unspecified tolerances shall be as follows;
* ( ) : Reference dimensions

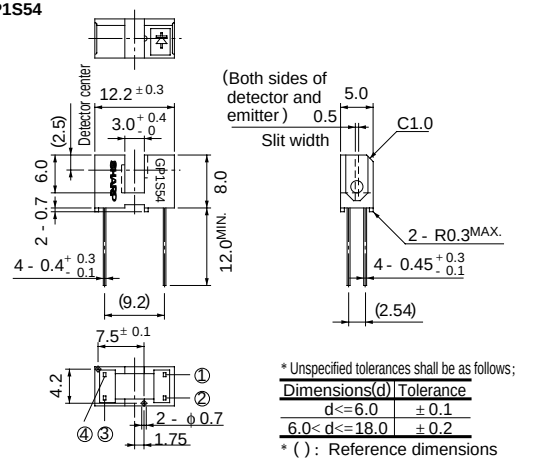
GP1S52V



Dimensions(d)	Tolerance
d<=6.0	± 0.1
6.0< d<=18.0	± 0.2

* Unspecified tolerances shall be as follows;
* ( ) : Reference dimensions

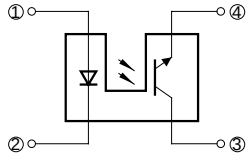
GP1S54



Dimensions(d)	Tolerance
d<=6.0	± 0.1
6.0< d<=18.0	± 0.2

* Unspecified tolerances shall be as follows;
* ( ) : Reference dimensions

Internal connection diagram (Common to 4 models)



① Anode
② Cathode
③ Collector
④ Emitter

■ Absolute Maximum Ratings (Ta = 25˚C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	*1 Peak forward current	I_{FM}	1	A
	Reverse voltage	V_R	6	V
	Power dissipation	P	75	mW
Output	Collector-emitter voltage	V_{CEO}	35	V
	Emitter-collector voltage	V_{ECO}	6	V
	Collector current	I_C	20	mA
	Collector power dissipation	P_C	75	mW
Operating temperature		T_{opr}	- 25 to + 85	˚C
Storage temperature		T_{stg}	- 40 to + 100	˚C
*2 Soldering temperature		T_{sol}	260	˚C

*1 Pulse width<=100μs, Duty ratio= 0.01
*2 For 5 seconds

■ Electro-optical Characteristics (Ta = 25˚C)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	GP1S50/ GP1S51V/ GP1S52V	V_F	I_F = 20mA	-	1.25	1.4	V
		GP1S54			-	1.2	1.4	
	Peak forward voltage		V_{FM}	I_{FM} = 0.5A	-	3	4	V
	Reverse current		I_R	V_R = 3V	-	-	10	μA
Output	Collector dark current		I_{CEO}	V_{CE} = 20V	-	1	100	nA
Transfer characteristics	Collector Current		Ic	I_F = 20mA, V_{CE} = 5V	0.5	-	5	mA
	Collector-emitter saturation voltage		$V_{CE(sat)}$	I_F = 40mA, I_C = 0.5mA	-	-	0.4	V
	Response time	Rise time	t_R	V_{CE} = 2V, I_{CE} = 2mA	-	3	15	μs
		Fall time	t_F	R_L = 100Ω	-	4	20	μs

Fig. 1 Forward Current vs. Ambient Temperature

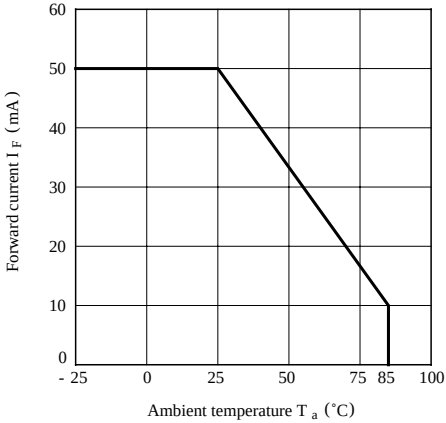


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

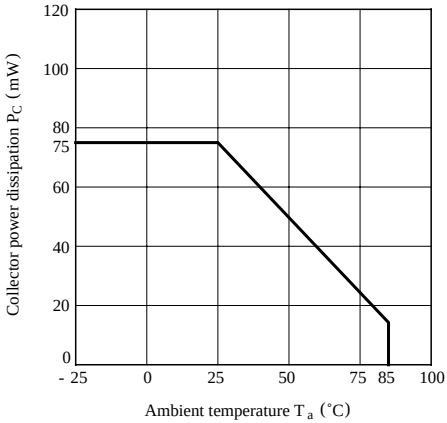


Fig. 3 Peak Forward Current vs. Duty Ratio

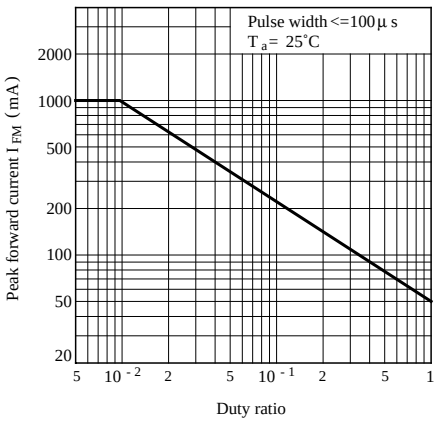


Fig. 4 Forward Current vs. Forward Voltage

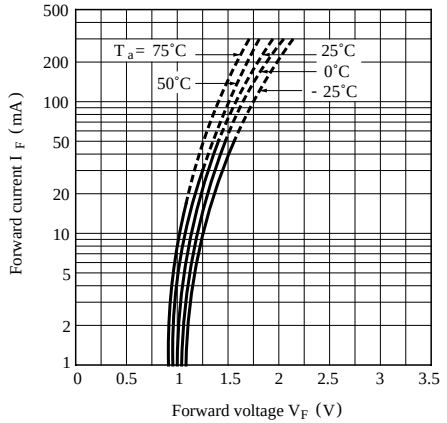


Fig. 5 Collector Current vs. Forward Current

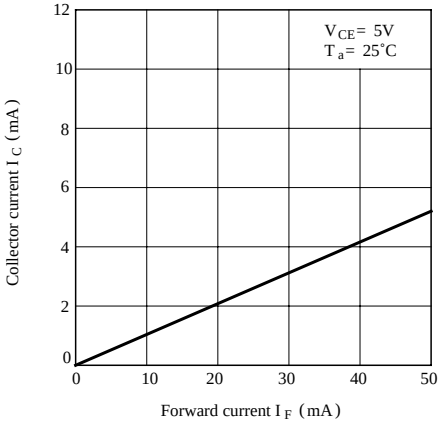


Fig. 6 Collector Current vs. Collector-emitter Voltage

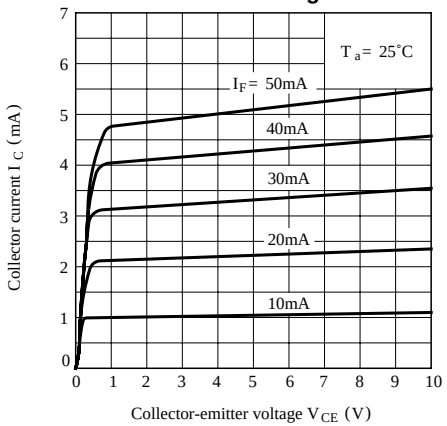


Fig. 7 Collector Current vs. Ambient Temperature

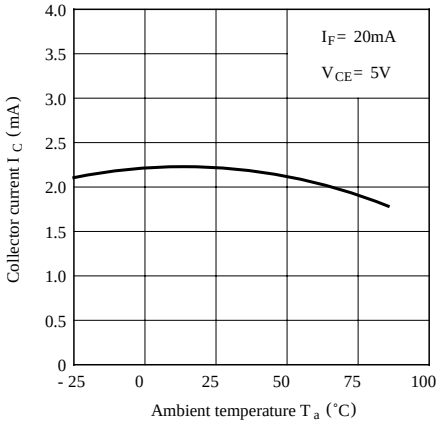


Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature

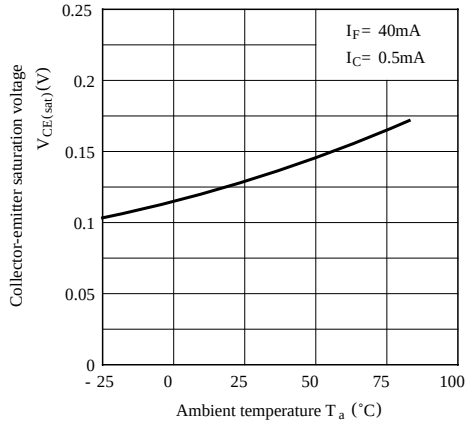
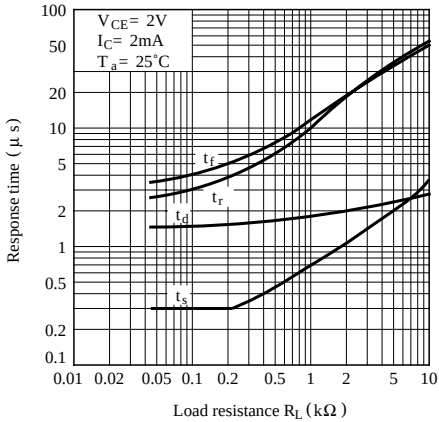


Fig. 9 Response Time vs. Load Resistance



Test Circuit for Response Time

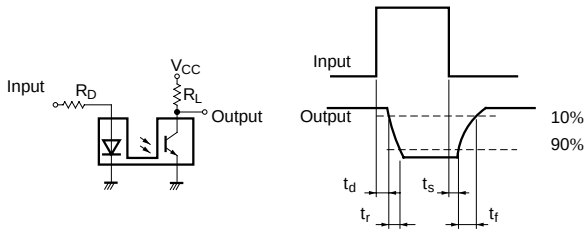


Fig.10 Frequency Response

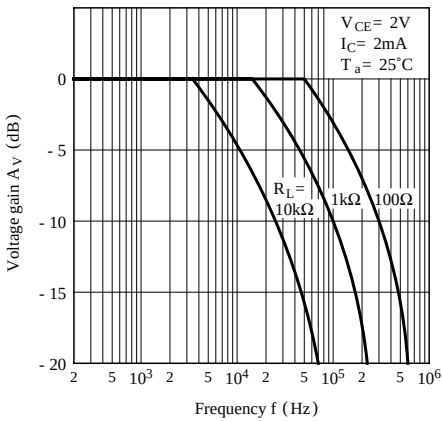


Fig.11 Collector Dark Current vs. Ambient Temperature

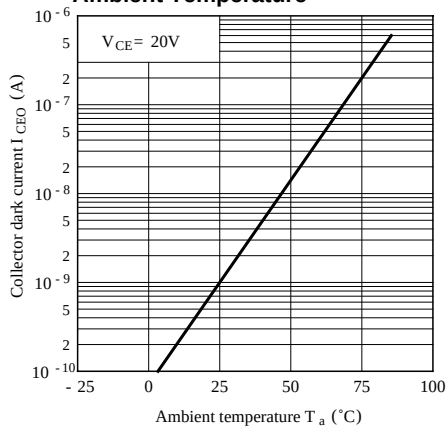


Fig.12 Relative Collector Current vs. Shield Distance (1)

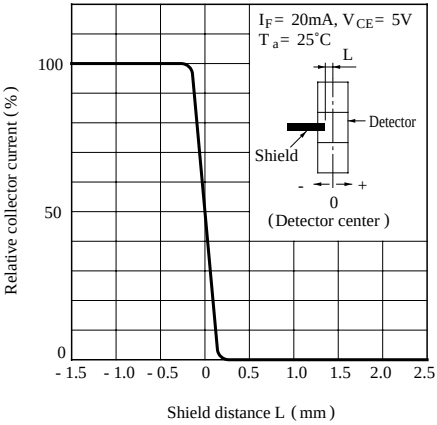
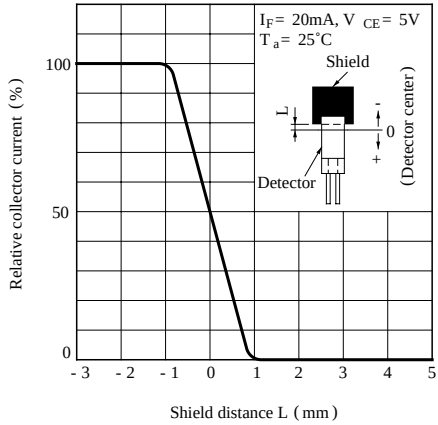


Fig.13 Relative Collector Current vs. Shield Distance (2)



■ Precautions for Use

(1) In case of cleaning, use only the following type of cleaning solvent.
Ethyl alcohol, methyl alcohol, Isopropyl alcohol

(2) Please refer to the chapter "Precautions for Use".

NOTICE

- The circuit application examples in this publication are provided to explain representative applications of SHARP devices and are not intended to guarantee any circuit design or license any intellectual property rights. SHARP takes no responsibility for any problems related to any intellectual property right of a third party resulting from the use of SHARP's devices.
- Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device. SHARP reserves the right to make changes in the specifications, characteristics, data, materials, structure, and other contents described herein at any time without notice in order to improve design or reliability. Manufacturing locations are also subject to change without notice.
- Observe the following points when using any devices in this publication. SHARP takes no responsibility for damage caused by improper use of the devices which does not meet the conditions and absolute maximum ratings to be used specified in the relevant specification sheet nor meet the following conditions:

(i) The devices in this publication are designed for use in general electronic equipment designs such as:
- Personal computers
- Office automation equipment
- Telecommunication equipment [terminal]
- Test and measurement equipment
- Industrial control
- Audio visual equipment
- Consumer electronics

(ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
- Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
- Traffic signals
- Gas leakage sensor breakers
- Alarm equipment
- Various safety devices, etc.

(iii) SHARP devices shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as:
- Space applications
- Telecommunication equipment [trunk lines]
- Nuclear power control equipment
- Medical and other life support equipment (e.g., scuba).

- Contact a SHARP representative in advance when intending to use SHARP devices for any "specific" applications other than those recommended by SHARP or when it is unclear which category mentioned above controls the intended use.
- If the SHARP devices listed in this publication fall within the scope of strategic products described in the Foreign Exchange and Foreign Trade Control Law of Japan, it is necessary to obtain approval to export such SHARP devices.
-
- Contact and consult with a SHARP representative if there are any questions about the contents of this publication.